



Ohio Fruit ICM News

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Evaluation of Dormant Applications of Phosphite Fungicides Combined with the Bark Penetrating Adjuvant Pentra-Bark® for Early Season Control of Apple Scab

Michael A. Ellis, Plant Pathology
The Ohio State University Extension

Venturia inaequalis is the fungus that causes apple scab. Apple scab is the most serious and economically important disease of apple crops throughout the Midwest and Northeast United States. When apple scab first develops it is characterized by soft, velvety, olive-green spots. As the infection progresses, the lesions enlarge and develop into thick, scabby growths on the fruit surface making them unfit for sale. If growers lose as little as 10% of their production to apple scab, it could eliminate all of their profit for the season. At present, the use of fungicides is the primary means of controlling the disease.

Fungicide resistance development in the apple scab fungus is an extremely important problem facing commercial apple production in Ohio orchards. Many of the fungicides that are currently used in Ohio, including the sterol-inhibiting fungicides and strobilurin fungicides are beginning to lose or have lost their effectiveness for controlling apple scab due to the development of fungicide resistance in the apple scab fungus.



Loss of the sterol-inhibiting fungicides has forced Ohio apple growers to return to using a protectant fungicide program where fungicides are applied on a 7-day schedule in place of an extended-protectant program where they are applied on a 10–14 day schedule. The change back to using a protectant program is resulting in an increased number of fungicide applications resulting in greatly increased costs to growers.

Preliminary experiments conducted in 2006 indicated that dormant applications of phosphite fungicides combined with the bark penetrating adjuvant Pentra-Bark® provided good control of early season (primary) apple scab without the use of additional fungicide applications. This could result in the elimination of four to five fungicide applications. The major objective of these studies was to conduct additional field trials to determine and demonstrate the efficacy of dormant and conventional foliar applications of a phosphite fungicide for control of early season apple scab.

The dormant applications in 2007 and 2008 did not perform as they did in 2006; however, results from 2008 were much better than 2007. In 2007 and 2008 the dormant applications provided a significant level of scab control; however, the level of control was not commercially acceptable. Results suggest that dormant applications of the phosphite fungicides are not effective for providing a consistent and commercially acceptable level of scab control and will not be recommended for use. On the other hand, foliar applications of the phosphite fungicides provided good control of apple scab and will be recommended for use in the apple scab disease management program.

The addition of the phosphite fungicides to our current arsenal of fungicides for combating apple scab will provide growers with new fungicide chemistry that can be used in alternating spray programs to prevent the further development of fungicide resistance in the apple scab fungus.

If you have articles for the newsletter that you would like to have considered to be included in upcoming issues, please submit to either Howard Siegrist at siegrist.1@cfaes.osu.edu or Melissa Swearingen at swearingen.34@cfaes.osu.edu



EMPOWERMENT THROUGH EDUCATION

North Central Ohio Tree Fruit IPM Program
Report Prepared by Cindy Crawford (Erie County Adm. Assoc.)

Mike Abfall – East District IPM Scout
(Erie and Lorain Counties)

Date – 8/23/10

Apples

Spotted Tentiform Leafminer – 48.4(down from 52.07)
Codling Moth – 3.1 (down from 4.4)
Apple Maggot – 1.2 (down from 1.35)
San Jose Scale – 142.8 (up from 55.3)
Oriental Fruit Moth – 5.3 (up from 4.56)
Lesser Appleworm – 1.3(up from .3)
Dogwood Borer – 3.5 (down from 11.57)

Peaches

Redbanded Leafroller – 18.3 (up from 13.3)
Oriental Fruit Moth – 0.7 (up from 0)
Lesser Peach Tree Borer – 5.3 (down from 7.7)
Peach Tree Borer – 1.6 (down from 1.7)

Date – 8/30/10

Apples

Spotted Tentiform Leafminer – 39.1 (down from 48.4)
Codling Moth – 1.7 (down from 3.1)
Apple Maggot – 1.7 (up from 1.2)
San Jose Scale – 164.4 (up from 142.8)
Oriental Fruit Moth – 4.1 (down from 5.3)
Lesser Appleworm – 0.8(down from 1.3)
Dogwood Borer – 2.3 (down from 3.5)

Peaches

Redbanded Leafroller – 7.3 (down from 18.3)
Oriental Fruit Moth – 0 (down from 0.7)
Lesser Peach Tree Borer – 2.7 (down from 5.3)
Peach Tree Borer – 0.7 (down from 1.6)

Ted Gastier – West District IPM Scout
(Sandusky, Ottawa, Huron and Richland Counties)

Date – 8/23/10

Apples

Spotted Tentiform Leafminer – 55 (up from 28)
Codling Moth – 1.5 (down from 2.8)
Apple Maggot – 0 (same)
San Jose Scale – 0 (same)
Oriental Fruit Moth – 16.7 (down from 21.5)
Dogwood Borer – 3.8 (down from 6.4)

Peaches

Red Banded Leafroller – 0 (same)
Oriental Fruit Moth – 1.3 (down from 2.3)
Lesser Peach Tree Borer – 5 (down from 9.3)
Peach Tree Borer – 1 (down from 1.7)

Date – 8/30/10

Apples

Spotted Tentiform Leafminer – 39 (down from 55)
Codling Moth – 1.7 (up from 1.5)
Apple Maggot – 0 (same)
San Jose Scale – 0 (same)
Oriental Fruit Moth – 25.2 (up from 16.7)
Dogwood Borer – 4.6 (up from 3.8)

Peaches

Red Banded Leafroller – 0 (same)
Oriental Fruit Moth – 2.3 (up from 1.3)
Lesser Peach Tree Borer – 5 (same)
Peach Tree Borer – 0 (down from 1)

Wayne County Insect Trap Reports
Ron Becker - Program Coordinator

Codling Moth

8/24 - 9.67, down from 12.89
8/31 - 11.11, up from 9.67
9/7 - 3.89 down from 11.11

Endosulfan Phaseout Announced by EPA

Rufus Isaacs and John Wise, Entomology
Michigan State University Extension

The EPA is taking action to end the use of the pesticide endosulfan. A formal Memorandum of Agreement with manufacturers of the agricultural insecticide will result in cancellation and phase-out of all existing endosulfan uses in the United States. Endosulfan is an organochlorine insecticide that has been used on a wide range of fruits and vegetables in Michigan over the years, although on a small percentage of the acres grown. A phase-out plan has been developed to allow growers time to develop and test alternative pest management tactics for the pests that endosulfan currently controls. For fruit crops grown in Michigan and the Upper Midwest, the phase-out deadlines are listed below. By the end of this year, new labels for endosulfan-containing products (Thiodan, Thionex, etc.), will contain details of the phase-out schedule.

If this phase-out plan raises concerns about the availability of pest control products for the pest complex on your farm, we suggest you talk with your local extension educator regarding registered alternatives, and gain some experience with them on part of your farm before the deadline. There are also some new miticides and insecticides being developed for some of the crops listed below and these may provide similar control. Additionally, the IR-4 program is working to support registration of new miticides and insecticides where grower organizations have supported petitions for an urgently-needed alternative to Thiodan before the phase-out deadline.

Read the complete [information about endosulfan and the phase-out](http://www.epa.gov/pesticides/reregistration/endosulfan/endosulfan-agreement.html#reement) posted online at <http://www.epa.gov/pesticides/reregistration/endosulfan/endosulfan-agreement.html#reement> on the EPA website.

Deadline for last use	Crops
July 31, 2010	Apricot, plum, annual strawberry, tart cherry
July 31, 2012	Other stone fruits including nectarine, peaches, and sweet cherry
July 31, 2013	Pear
July 31, 2015	Apple, blueberry
July 31, 2016	Perennial/biennial strawberry

2010 Upcoming Events:

November 8-10, 2010. Southeast Strawberry Expo, Wyndham Hotel, Virginia Beach, VA. Workshops and farm tour on Nov. 8, educational sessions and trade show on Nov. 9-10 For more information, visit www.ncstrawberry.com or contact the NC Strawberry Association, 919-542-4037, info@ncstrawberry.com. Exhibitor inquiries welcome.

December 7-9, 2010. Great Lakes Fruit Vegetable and Farm Market EXPO, DeVos Place Convention Center, Grand Rapids, Michigan. For more information: <http://www.glexpo.com>.

Dieback Issues in McIntosh Cultivars in Michigan

George Sundin, Plant Pathology; Amy Irish-Brown, MSU Extension Educator; and Tyre Proffer, Plant Pathology
Michigan State University Extension

Several orchards of McIntosh apple cultivars have been reporting severe branch dieback. The similarities among the affected trees are that the cultivars are primarily Linda Mac and Pioneer Mac with the trees grown on dwarfing rootstocks. The Tree Fruit Pathology lab at Michigan State University has been collecting samples throughout Michigan as growers report symptoms. This article is a summary of knowledge thus far relating to this situation.

Initial dieback symptoms began to be reported to us in 2008 on Linda Mac apples in isolated blocks. From these first samples, the fungal organism that causes anthracnose disease, *Cryptosporiopsis curvispora*, was identified. By 2010, more blocks throughout Michigan were reporting dieback symptoms, and we have obtained samples from many of those. When samples are collected, information such as planting year, rootstock, cultivar, site details and nursery source was gathered as well. At this time, there appears to be no common nursery source for affected trees. All are on various dwarf rootstock plantings with no correlation either to one particular rootstock.

The focus of the tree fruit pathology lab has been on identification of a causal organism so we can best fit management recommendations to the disease. Currently, several fungal organisms have been isolated from various samples of dying branches. Thus, there are likely multiple pathogens involved in causing this dieback problem statewide. Most of these fungi are opportunistic organisms, and we have isolated the causal agent of black rot (*Botryosphaeria obtusa*), white rot or bot rot (*Botryosphaeria dothidea*), anthracnose (*Cryptosporiopsis curvispora* or *C. perennans*), as well as *Leucostoma* (*Cytospora*), *Alternaria*, and *Nectria cinnabarina*. To summarize, currently five different fungi have been isolated in association with this disease problem in addition to the anthracnose pathogen *C. curvispora*.

While any one of these fungi could be causing the initial infection, it is very difficult to determine if only one is causing dieback, when all are commonly isolated. These fungi typically move into already damaged tissue to cause further rot, but alone, most of these fungi do not **usually** cause stem cankers. It should also be noted that once isolated cultures are identified, they will all have to be inoculated into similar apple systems to determine if the same symptoms of dieback are found.

Here are some thoughts on why we are observing this disease in McIntosh now when this cultivar has been a staple of the Michigan apple industry for many years. The first observation is that symptoms are expressed on newer cultivars of McIntosh – cultivars that have had very little field testing prior to release by nurseries. Our current apple marketing system demands new and improved varieties all the time. New cultivars go from discovery to nursery propagation very quickly. In this accelerated system, growers assume all the risk when planting new apple cultivars with little or no research on possible novel cultivar-specific problems being done prior to field planting.

Our data regarding the involvement of multiple fungal opportunistic pathogens in this disease also suggests that horticultural issues associated with these newer cultivars are in play. Perhaps newer plantings of these McIntosh cultivars on dwarf rootstocks are not hardening off well and some early winter cold weather is causing damage to tissues thus enabling infection by these opportunistic fungi. Thirdly, there has also been much talk lately of the effects of glyphosate herbicide use on apple tissues. Most interesting is that glyphosate injures apple bark tissue, not enough to kill the tree, but just enough to allow an opportunity for fungi to infect wounded areas. Thus, herbicide issues may also be in play in terms of providing access to fungal pathogens.



Linda Mac Dieback

Continued on Page 5

Dieback Issues in McIntosh Cultivars in Michigan: Continued from Page 4

Examples of Dieback



Get Ready for the New Fumigant Regulations

Edited from an article by Joe Noling, University of Florida, IFAS, CREC, Lake Alfred, FL, and Andrew MacRae, University of Florida, IFAS, GCREC, Balm, FL. See also the article in the July 2010 issue of The Strawberry Grower by Bob Bruss, NCDA&CS. Thank you to Joe Noling for sharing this; for the complete article, contact the NCSA office.

With reregistration of the soil fumigants near complete, EPA has mandated the addition of many new changes to fumigant labels which include a variety of new risk mitigation measures in a two-year stepwise approach. The fact that the reregistration process is nearly over should come as no surprise to anyone since we have been presenting ‘the doom and gloom’ message to growers for a number of years now. So, as another advanced warning, be advised that some of the new label requirements will begin this December 2010, while others will be required to be included on revised labels which will appear on product containers in mid- to late 2011.

Beginning December 2010, new label language will formally require certified applicators to complete a written, site-specific Fumigant Management Plan (FMP) prior to any day’s fumigant application in the field. For this first phase of new labels, the FMPs must only capture current and first phase label requirements. In 2011, the FMPs must also capture second phase label requirements which include documenting compliance with new buffer zone requirements and emergency preparedness measures and procedures.

Fumigant Management Plans: When the new fumigant labels appear in 2010, each fumigant applicator will need to ensure that a site-specific FMP has been prepared before beginning a fumigant application in the field on any given day. The certified applicator will also be required to complete a daily checklist and prepare a post-application summary report to document any deviations from the FMP that may have been necessary, as well as any results of air monitoring done during and/or after the application. EPA believes that the FMPs will reduce potential risks to bystanders, people living in close proximity, and handlers in the field by requiring that applicators have carefully planned each day’s fumigation, and by forcing applicators to document (in writing) how they intend to comply with all of the new label changes and requirements.

Some of the major elements within the FMP that certified applicators will need to address include general site and applicator information, application method and tarp repair procedures, weather and soil conditions, and a description of how the fumigator plans to comply with label requirements for GAPs, buffer zones (second- phase labels), air monitoring, worker training and protective equipment, posting of signage, and providing notification to neighbors should it be needed. The FMPs will also require the applicator to identify the names and addresses of handlers participating in the fumigation prior to the event, plans for communication between the applicator and others involved in the fumigation, and to document how emergency situations will be handled.

The post-fumigation summary will need to describe any deviations from the FMP, measurements taken to comply with GAPs, and information about any problems, such as complaints or incidents, that occurred as a result of the fumigation.

Once the application begins, the certified applicator must be prepared to make a copy of the FMP available for viewing by handlers involved in that day’s fumigation. The new fumigant labels also will specify requirements for archiving the FMP for 2 years and that FMPs must be provided, upon request, to enforcement officials, handlers involved in the fumigation, and emergency response personnel.

The certified applicator will also be required to monitor for pungent odors of fumigant gases in areas between the buffer zone perimeter and residences or other occupied areas four times during the day (dawn, dusk, and once during the night and day) to ensure perceived odors do not exceed the action levels requiring enforcement of emergency procedures and notification of neighboring landowners surrounding the field.

Soil and Weather Conditions: Prior to a day’s fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted to occur and decide whether to proceed. Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories must be obtained and documented within the site-specific FMP. The site-specific management plan also requires soil moisture to be measured and recorded at a depth of 9 inches at either end of the field, no more than 48 hours prior to application. Soil moisture must be measured or estimated to be 50 to 80% of field holding capacity (depending on the specific product label) before proceeding with a fumigant application. Soil moisture must be determined by the USDA Feel and Appearance Method or with an instrument, such as a tensiometer. If soil moisture is too low or too high, the soil moisture must be adjusted by irrigation or tillage. The method in which soil moisture is determined must be reported in the FMP and the results from either method documented within the post application summary. We believe it behooves the applicator to spend the time to take the measurements to avoid compliance infractions and to minimize potential liabilities and future litigation, should claims of incidents of exposure arise at some future time.

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Get Ready for the New Fumigant Regulations - continued from page 6

Definition of Handlers: The new fumigant labels will clarify fumigation tasks that meet EP A's definition of handler activities to include most, if not all, people in the field. The FMP s require that identification of all handlers working in the field (including names, phone numbers, addresses, tasks they are trained and authorized to perform, and dates of training certifications) be completed prior to the start of each day's soil fumigation activity. Those who lack office staff and computer capability may be seriously challenged by this new requirement to publish a printed listing of this information before start of fumigation in the field each morning.

Concluding Remarks: Clearly, the new fumigant labels will represent a significant change in the way growers use soil fumigants. Grower obligations required to develop and implement the new fumigant label requirements will be complex and time-consuming, and will add a new burden of grower responsibility and liability. The future of fumigant use will demand a broader respect, recognition, and need for stricter adherence to fumigant label language and a more vigilant understanding and observance of Good Agricultural Practices. These changes will require closer observance of newly required product stewardship and worker safety certification programs, as well as greater consideration of people and land areas surrounding a fumigated field. The new fumigant use requirements will clearly demand an increased focus on clerical and communication skills, including an expedited system of documenting, training, and certifying workers who participate in soil fumigation.

NCSU and the University of Florida are cooperators in a region-wide program to develop training modules and resources for growers. Workshops for information, training, and obtaining respirators and respirator fit/fitness testing will be held across NC during 2011, under the auspices of the RMM Project, with which NCSA is a cooperator, that has been funded by the Tobacco Trust Fund.

STRAWBERRY Virginia Beach EXPO

Focus on Fumigation at the Expo

Not only is methyl bromide being phased out, but growers in our region will need to follow the new fumigant regulations going onto the labels in December, 2010 when they fumigate next year. It is a lot of change to deal with.

We have more than four hours of breakouts devoted to fumigant issues and information at the Expo. Some of the topics to be addressed: Which fumigant is best for you, in your situation? What are the options for NOT fumigating? What are the new regulations and what will you need to do? (The article to left certainly makes clear how complicated the new Fumigant Management Plan requirements are!)

Our presenters include Rob Welker, NCSU Methyl Bromide Alternatives Project Coordinator; Frank Louws, NCSU Dept. of Plant Pathology; Bob Bruss, NC Dept. of Agriculture, and staff of the NC Agrimedicine Institute, which has obtained a grant from the Tobacco Trust Fund to assist with information, training, and especially all the issues involving respirators – including obtaining them at reduced prices.

The Expo will also be a good opportunity to talk to suppliers and registrants for the fumigants, who also have training obligations under the new regulations.

Glyphosate Injury Linked to Apple Tree Collapsing?

Mira Danilovich, District Horticulture/Marketing Extension Educator
Michigan State University Extension

In the last several years, there has been increased concern about resurgence of apple tree collapsing caused by *Botryosphaeria* sp. Cornell's Dave Rosenberger talked about it several years ago at one of our MSUE fruit schools. Since then, disease symptoms have become more common in our orchards, particularly in McIntosh and Honeycrisp blocks. There has been a suspicion that glyphosate (RoundUp™) applications were responsible for the initial injury that led to fungal invasion and lesion development and tree collapsing. We have had confirmed *Botryosphaeria* sp. problems in a few apple orchards in the Hart/Shelby area in the last three to four years. There is an excellent article in Cornell's Scaffolds Journal (August 2, 2010) Vol.19, No. 20 (starting on page 4)

<http://www.nysaes.cornell.edu/ent/scaffolds/2010/100802.pdf> addressing this very same issue.

In addition to potential influence on disease development, in the article, Potential non-target effects of glyphosate on apples, Dave Rosenberger is citing Ohio State research that has shown even low rates of glyphosate delivered to trunks of field grown ornamentals can cause reduced winter hardiness and induce bark cracking in several ornamental trees including crabapple (Daniels et al. 2009).

Controlling Botrytis Bunch Rot in Grapes

Annemiek Schilder, Plant Pathology
Michigan State University Extension

Early symptoms of Botrytis bunch rot (gray mold), caused by the fungus *Botrytis cinerea*, have been showing up in grape clusters in some locations. However, in many cases, it was found to be associated with grape berry moth infestation. The entry point and tunnels created by the larva allow entry of Botrytis into the berry. So check the affected berries closely and look for the tell-tale entry hole and webbing. You may see a larva upon opening up the frass and berries. However, frequent precipitation and high humidity do enhance Botrytis and growers should be prepared, particularly if it rains heavily in the weeks before harvest. Tight-clustered varieties, such as Pinot Noir, Pinot Gris, Vignoles, etc. are most seriously affected. Botrytis bunch rot may be confused with sour rot, which is caused by bacteria and yeasts. The main difference is that clusters with sour rot smell distinctly like vinegar and do not support the gray sporulation typical of *Botrytis*.

Botrytis biology: *Botrytis cinerea* is a “weak” pathogen that primarily attacks highly succulent, dead, injured, or senescent tissues such as wilting blossom parts and ripening fruit. The fungus thrives in high humidity and still air (optimum temperature: 59-77°F). Grape berries are most susceptible to infection after veraison. However, if Botrytis spores are available and wet conditions prevail, berries can become infected anytime after bloom. Infection occurs through scars left by the fallen caps or by contact with sporulating floral debris. Infections often remain latent (dormant) until the fruit ripens or may not progress at all. However, the few that do activate can lead to rapid disease spread within the cluster as berries become highly susceptible upon ripening. Controlling infections at bloom provides no benefit if post-veraison weather is dry and doesn't support further disease development, but can pay significant dividends if the weather turns wet before harvest. In most years, fungicide applications at veraison and preharvest are more beneficial than earlier applications.

Factors that favor the disease: Factors that cause latent infections to activate are poorly understood, although high humidity and tissues with elevated nitrogen levels appear to promote this process. Cluster compactness also has a pronounced effect on disease development, due largely to rapid berry-to-berry spread. In addition, berries in tight clusters often crack due to pressure within the cluster, providing moisture and nutrients for growth as well as an entry point for the fungus. Insect or other injury, e.g., grape berry moth holes, can also lead to Botrytis as well as sour rot infection. Research in New York has shown that late powdery mildew infections (barely visible with the naked eye) of the berries can also predispose them to rots.

Control options Promoting good air circulation by canopy management and leaf pulling is an important cultural option for managing Botrytis bunch rot. In past trials in Michigan, leaf removal has been one of the best treatments for control of bunch rots (Botrytis and sour rot) and comparable to fungicide treatments. Avoid excessive leaf pulling, as berries may suffer from sun scald when suddenly exposed to sunlight and high temperatures. Sun scalding is usually restricted to the sides of the berries exposed to the sun and will appear like browning and collapsing (flattening) of the affected berry surface. Sun-scalded berries tend to dry up rather than rot. There are some products available that reduce sun damage to fruit crops: Purshade (calcium carbonate) and Surround (kaolin clay), but they have not been tested on grapes in Michigan as far as I know. There are currently some excellent fungicides available for control of Botrytis bunch rot.

Controlling Botrytis Bunch Rot in Grapes - Continued from Page 8

- **Elevate** (Hydroxyanilides; locally systemic; 0-day PHI): good to excellent preventive and limited post-infection activity.
- **Vangard** (Anilinopyrimidines; systemic; 7-day PHI): good to excellent preventive and post-infection activity.
- **Scala** (Analinopyrimidines; systemic; 7-day PHI): good to excellent preventive and post-infection activity.
- **Endura** (Carboxamides; systemic; 14-day PHI): good to excellent preventive and post-infection activity. Use at 8-oz rate for Botrytis control.
- **Rovral** (Dicarboximides; locally systemic; 7-day PHI): moderate to good preventive activity; activity is improved by addition of oil or non-ionic spray adjuvant. Some vineyards may have resistant strains if Rovral was used a lot in the past.
- **Pristine** (strobilurins; systemic; 14-day PHI): good preventive and post infection activity but only at the high rate (18.5-23 oz/acre).
- **Topsin M** (Benzimidazoles; systemic; 14-day PHI): moderate preventive and post-infection activity.
- **Serenade** (Biological control agent; protectant; 0-day PHI): fair to moderate preventive activity. Organic for-

A Late-Season Flight of Grape Berry Moth

Rufus Isaacs, Entomology
Michigan State University Extension

Monitoring traps for grape berry moth checked in the past few weeks across southwest Michigan have indicated an upswing in activity from grape berry moth at high pressure sites, with associated egg laying on berries. This pest pressure seems mainly in traditional hot spots, but growers are advised to check their vineyards (especially on wooded borders) to look and see whether they are getting new infestations developing at the vineyard edges. With the cooler nights and windy days this week, the suitability of the weather for berry moth mating and reproduction is not ideal. But, this pest has apparently been able to provide some late-season pest pressure by trying to fit in another generation.

If vineyards are being harvested this week or next they are unlikely to benefit from attempts to control berry moth, because larvae are either already inside berries, or the eggs laid in the next week will grow slowly under these cool temperatures, making them less likely to be detected. For those hot spots where additional activity is being seen in vineyards that are being harvested later in September or early October, growers will need to decide whether additional expense is worthwhile at this point in the season. This decision will obviously need to take into account the level of infestation, expenses to date in the vineyard, and the level of crop present.

Why are we seeing this late season berry moth activity? With the very warm 2010 season, we have accumulated sufficient degree days for a fourth generation of this pest, exceeding the 2,430 growing degree days from wild grape bloom that is required to start another generation. This is much more than usual, and the insects are responding to this heat. For comparison with last season, we had accumulated 2,660 grape berry moth degree days in Berrien Springs yesterday, September 8, whereas only about 2,100 had been accumulated at this time last year. In a typical season, as the days get shorter in August grape berry moth enters a resting state or “diapause” so that larvae develop to pupae and then stop at the pupal stage to make it through the winter. With this season’s hot summer, they apparently could detect the signal from the environment that it might be worth trying another generation, and so the heat counterbalanced the usual effect of the shorter days. This resulted in a significant portion of the larvae developing through to adult moths that are now flying, mating and looking for egg-laying sites on clusters. As a result, we are now seeing some higher late-season activity from berry moth.

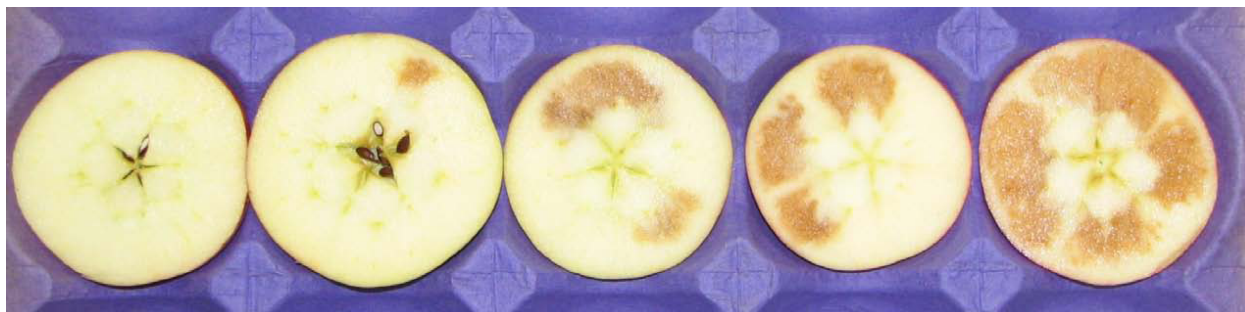
Controlling Botrytis Bunch Rot in Grapes - Continued from Page 8

- **Elevate** (Hydroxylanilides; locally systemic; 0-day PHI): good to excellent preventive and limited post-infection activity.
- **Vanguard** (Anilinopyrimidines; systemic, 7-day PHI): good to excellent preventive and post-infection activity.
- **Scala** (Analinopyrimidines; systemic; 7-day PHI): good to excellent preventive and post-infection activity.
- **Endura** (Carboxamides; systemic; 14-day PHI): good to excellent preventive and post-infection activity. Use at 8-oz rate for Botrytis control.
- **Rovral** (Dicarboximides; locally systemic; 7-day PHI): moderate to good preventive activity; activity is improved by addition of oil or non-ionic spray adjuvant. Some vineyards may have resistant strains if Rovral was used a lot in the past.
- **Pristine** (strobilurins; systemic, 14-day PHI); good preventive and post infection activity but only at the high rate (18.5-23 oz/acre).
- **Topsin M** (Benzimidazoles; systemic; 14-day PHI): moderate preventive and post-infection activity.
- **Serenade** (Biological control agent; protectant; 0-day PHI): fair to moderate preventive activity. Organic formulation can be used in organic vineyards.

Apple Storage Disorders and Their Control

R.M. Beaudry, Horticulturist
Michigan State University Extension

Visit www.apples.msu.edu to find MSU horticulturist Randy Beaudry's resource on apple disorders and their control. You will find the 44-page pdf filled with helpful information and color photos. Visit the homepage for the link or click on the Maturity and Storage page.



Central Ohio Poison Control Number

(800) 222-1222

TTY # is (614) 228-2272

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